5.4.11 Tornadoes / Dust Devils

History

Between 1971 and 2006, there were 160 tornadoes ranging from F0 to F3 on the Fujita scale recorded across Arizona. The total property damage was $44.7 million with 1 death and 107 injuries. Total crop damage was approximately $30,000. The Fujita scale ranks tornados by wind speed, with F0 having winds less than 73 mph, F1 has winds between 73 and 112 mph, F2 has winds between 113 and 157 mph, and F3 has winds between 158 and 206 mph. There was one F3, reported in Yavapai County, five F2s reported in Maricopa County, and one F2 in Coconino County. The tornados have been reported in all counties except Graham, Greenlee and Santa Cruz, with the most tornados (39) reported in Maricopa County. The other highly populated counties of Coconino, Yavapai, Navajo, Pima and Pinal each had at least 14 tornados (NCDC Storm Events Database, searching 1971-2006).

Magnitude	Number	Deaths	Injuries	Property Damage	Crop Damage
F3	1	0	0	$0	$0
F2	6	0	44	$33.05 million	$0
F1	50	1	60	$11.285 million	$30,000
F0	103	0	0	$367,000	$0

In addition, using the National Climate Center (NCDC) Storm Database, 57 significant tornadoes were identified between 1971 and 2006, none of which resulted in a disaster/emergency declaration. These events caused at least 1 death, $50,000 of damage or were severe enough to be identified in historical records. The following were included in the findings:

- June 21, 1972, an F2 tornado in Pinal County, 3 injuries and $25 million in damages (NCDC Storm Event Database).
- June 23, 1974, one person was killed and 40 injured by an F2 tornado in Pima County (NCDC Storm Event Database).
- September of 1996, an F1 tornado in Chino Valley in Yavapai County. Two mobile homes received moderate damage and were moved off their foundations. Several power poles were snapped off at three feet above the ground and a greenhouse was extensively damaged. Property damage of $250,000 & crop damage of $30,000 was reported (NCDC Storm Event Database).

Dust devils are small wind vortices that begin near the surface and lift dust and debris upward in a small spiral that may reach 1,000 feet in height. The winds are generally well below 50 mph, typically do little damage, nor cause injury. Their lifetimes are very short, on the order of minutes and we are unaware of any injuries or damage caused by dust devils in Arizona.

Probability and Magnitude

Most Arizona tornadoes occur from March through October, with nearly all being category F0 and F1 on the Fujita scale and only one F3 tornado has been reported in Arizona since 1971. Compared to Oklahoma which receives on average 7.5 tornadoes annually, the highest state rate of occurrence per 10,000 state square miles, tornadoes are rare in Arizona, occurring at a rate of 0.3 annually per 10,000 state square miles. The State experiences less than three F0 tornadoes per year on average and less than two F1 or stronger tornadoes per year on average, between 1971 and 2006.

Vulnerability

Dust/Sand Storms, Thunderstorms/High Winds, and Tornadoes/Dust Devils all typically occur as a result of thunderstorms and are all associated with high wind events. For more information on Tornadoes/Dust Devils refer to "Thunderstorms/High Winds" vulnerability assessment.

For the local risk assessment summary, the table below combines asset and predominantly HAZUS information for the estimated losses as reflected in local plans. The potential total number of facilities in the hazard areas is 1,275,149 at a replacement cost of $239 billion. The estimated losses for the hazard areas are approximately $1.1 million.

Summary of Local Risk Assessment & Loss Estimates based on Tornadoes/Dust Devils			
	Total Assets $ (Assets +HAZUS) x $1,000	# of Facilities Impacted (Assets + HAZUS)	Estimated Loss
Statewide Totals	$238,965,224	1,275,149	$1,109,400
Maricopa	$188,380,403	994,383	$658,000
Mohave	-----	-----	$10,400
Pima	$50,584,821	280,766	$441,000
----- Denotes lack of available information for assessment.			

Sources:

National Climate Data Center, January 2003. Storm Event Database. http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms#NOTICE